with a lead frame associated with upper portion 12 and a lead frame associated with lower portion 14 of insert 10. The signal transfers from insert 10 via pins 42 into PCB 104. The signal is transferred from PCB 104 to insulation displacement contacts ("IDC") 110 which is connected to a second UTP cable 112, thus completing the data interface and transfer through insert 10.

In the 4 pair connecting hardware system, multiple pairs of plug contacts 114 for data signal transmission are provided. These contact positions generally correspond to lead frames. The first pair 116 of plug contacts 114 mates with lead frames 22 and 24, the second pair 118 with lead frames 16 and 18, the third pair 120 with lead frames 20 and 26, and the fourth pair 122 with lead frames 28 and 30.

A significant portion and, in many instances, a majority of the coupled noise associated with the RJ45 plug arises from the adjacency of the paired arrangements. On a relative basis, the worst case NEXT noise in a RJ45 plug is a balance coupled negative noise, meaning the noise is coupled equally upon the adjacent pairs. Thus, with reference to Figure 13, the worst effect in a 4 pair RJ45 plug module is typically exhibited in plug contacts numbered as 3, 4, 5 and 6, corresponding to pairs 116 and 120 and lead frames 20 through 26, because both sides of the transmitting and receiving signal are adjacent to each other. The other pairs of a RJ45 plug also create noise problems, but such problems are of significantly lesser magnitude because only one wire of the pair is the noise source.

With further reference to the Figures, the input signal from plug 108 is split into two separate reactances at contact portion 34. One portion of the signal is directed towards end portion 35 of the lead frames and the other towards end portion 41 of the lead frames. The signal portion directed towards end 35 of the lead frames flows into PCB 104 for energy transmission to the output UTP cable 112 connected with IDC 110. Signals in lead frames 22 and 24 of pair 1 are capacitively and inductively coupled upon pair 3 connected lead frames 20 and 26, e.g., by approximately .18pF, which increases the positive signal

inductance coupling by approximately 3.6nH. Lead frame 20 from pair 3 is capacitively and inductively coupled upon the lead frame 18 from pair 2, e.g., by approximately .11pF, which increases the positive signal inductance coupling by approximately 3.1nH. The lead frame 24 from pair 1 is also designed to reduce its coupling effect upon the lead frame 30 from pair 2 by reducing its parallelism via direction-altering segments in the lead frames.

The signal portion directed away from PCB 104 toward end portions 41 of the lead frames results in static energy coupling from the input signals. Lead frames 22 or 24 of pair 1 are capacitively coupled upon lead frames 20 or 26 of pair 3. Also, lead frames 20 or 26 from pair 3 is capacitively coupled upon lead frames 18 or 16 from pair 2 and lead frames 28 and 30 from pair 4. A portion of lead frame 22 or 24 of pair 1 is capacitively coupled upon one lead frame 28 or 30 of pair 4 and lead frame 16 or 18 of pair 2.

The formation of lead frames 16 through 30 results in splitting the signal and reducing crosstalk noises by, among other things, causing separate and dual reactances, that is, one being the inductive/capacitive reactances combination and the other being the static mode capacitive reactance. The lead frames may be arranged and/or bent in different formats. One format aligns all contacts in order, which increases the parallelism of the wire pairs. The other format, in accordance with the present disclosure, aligns all contacts in two distinct bends, with the lead frames associated with upper portion 12 in parallel to each other, and the lead frames associated with the lower portion 14 in parallel to each other, but not parallel with regard to lead frames of differing associations, which reduces NEXT more effectively.

By enhancing and reducing the parallelism of the lead frames at opposing end portions in accordance with the known coupling problems inherent in the RJ45 plug system, lower capacitive and inductive coupling will occur as the frequency increases up to 250 MHz. The advantageous end result is an insert device that has lower NEXT, FEXT and impedance in certain wire pairs. The reduction of a majority of crosstalk noise occurs

by combining indirect and direct signal coupling in the lead frames associated with central pairs 1 and 3, as well as the other pairs 2 and 4 in the RJ45 plug.

Negative noise that was introduced is counter coupled with positive noise, thereby reducing the total noise effects and re-balancing the wire pairs output. The lead frames are electrically short, e.g., approximately less than 0.27 inches, which reduces the negative noise coupling by reducing the parallelism of the adjacent victim wire and reducing the signal delay to a PCB that could contain further coupling circuitry. The additive positive noise and reduction of the unwanted negative noise coupling of the lead frame wires work at precisely the same moment in time, which allows optimal reduction for lower capacitive and inductive coupling. The combination of the split signals provides an enhanced low noise dielectric modular housing for high speed telecommunication connecting hardware systems, among other things. The advantageous end result is a modular insert device that has lower NEXT, FEXT and impedance within its wire pairs.

Thus, the present disclosure provides a system, device and method for reducing crosstalk noise without requiring new equipment or expensive re-wiring. The victim crosstalk noise is eliminated by a combination of the appropriately placed positive feedback signal reactance circuitry and by utilizing a noise balancing dual reactance dielectric insert. This operation is accomplished by forming the appropriate contacts within the dual reactance dielectric insert for noise reduction. By using the dual reactance dielectric insert, the amount of unwanted signals can be induced to cancel that which was injected by the plug input, thus increasing the system's signal to noise ratio and network's bit error rate.

This method and system approach provides a more laboratory controlled product than other crosstalk reduction designs, which greatly improves design time, efficiency and cost. This method and system approach also provides a way to effectively remove